

National Park Service Mississippi River Forum



FROM THE RIVER TO THE TAP: Making the Mississippi River into Drinking Water

Shane Lund, Water Quality Coordinator



Presentation Goals:

Runoff Affects Drinking Water Treatment

2012 Case Study Perfect Storm

Water Treatment Virtual Tour

National Park Service Mississippi River Forum



Drinking Water Treatment:

What We Do:

Efficiently produce and deliver clean, safe drinking water.

Challenges:

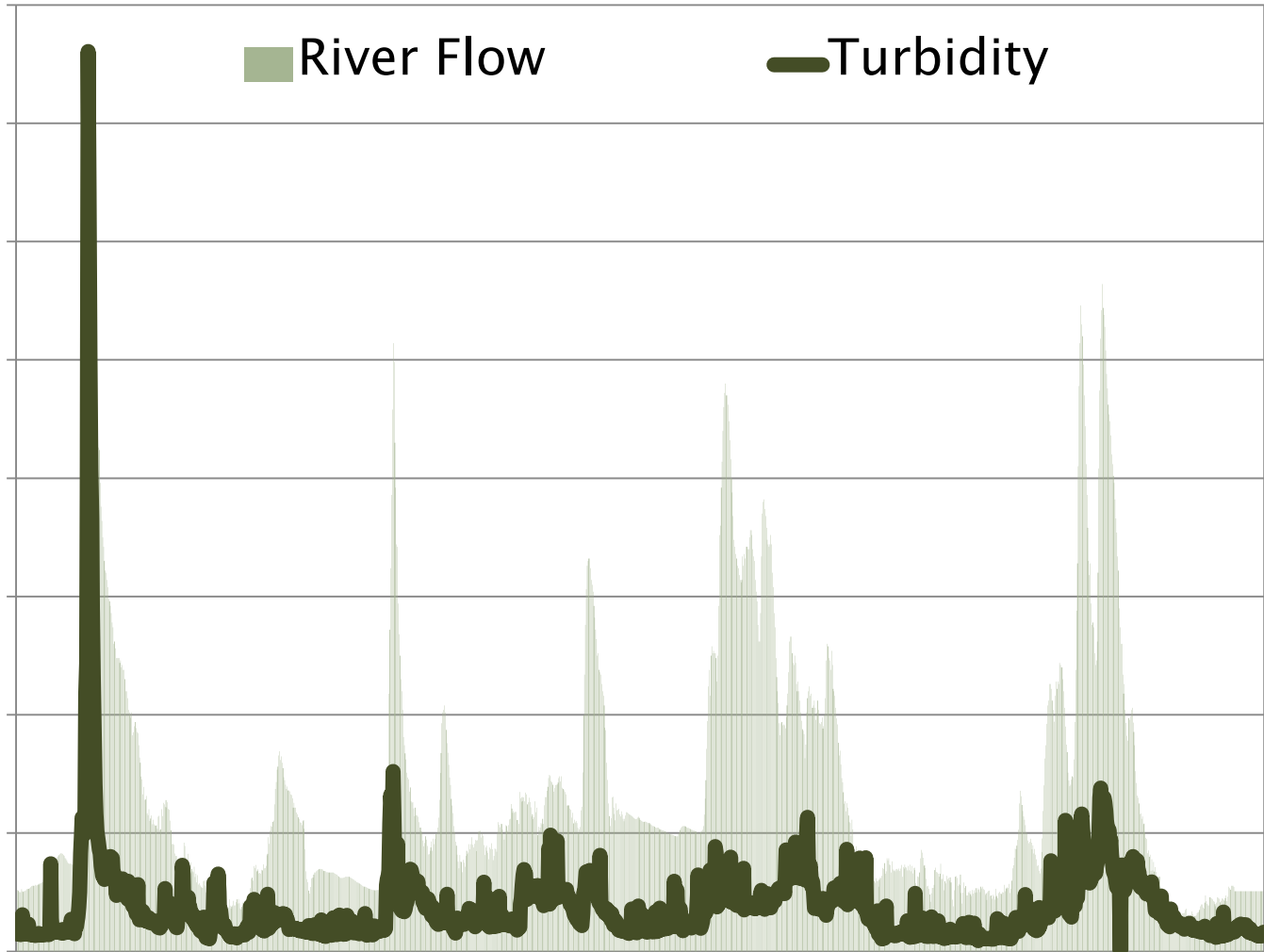
Stringent Regulations

Production Cost

Variable Source Water Quality

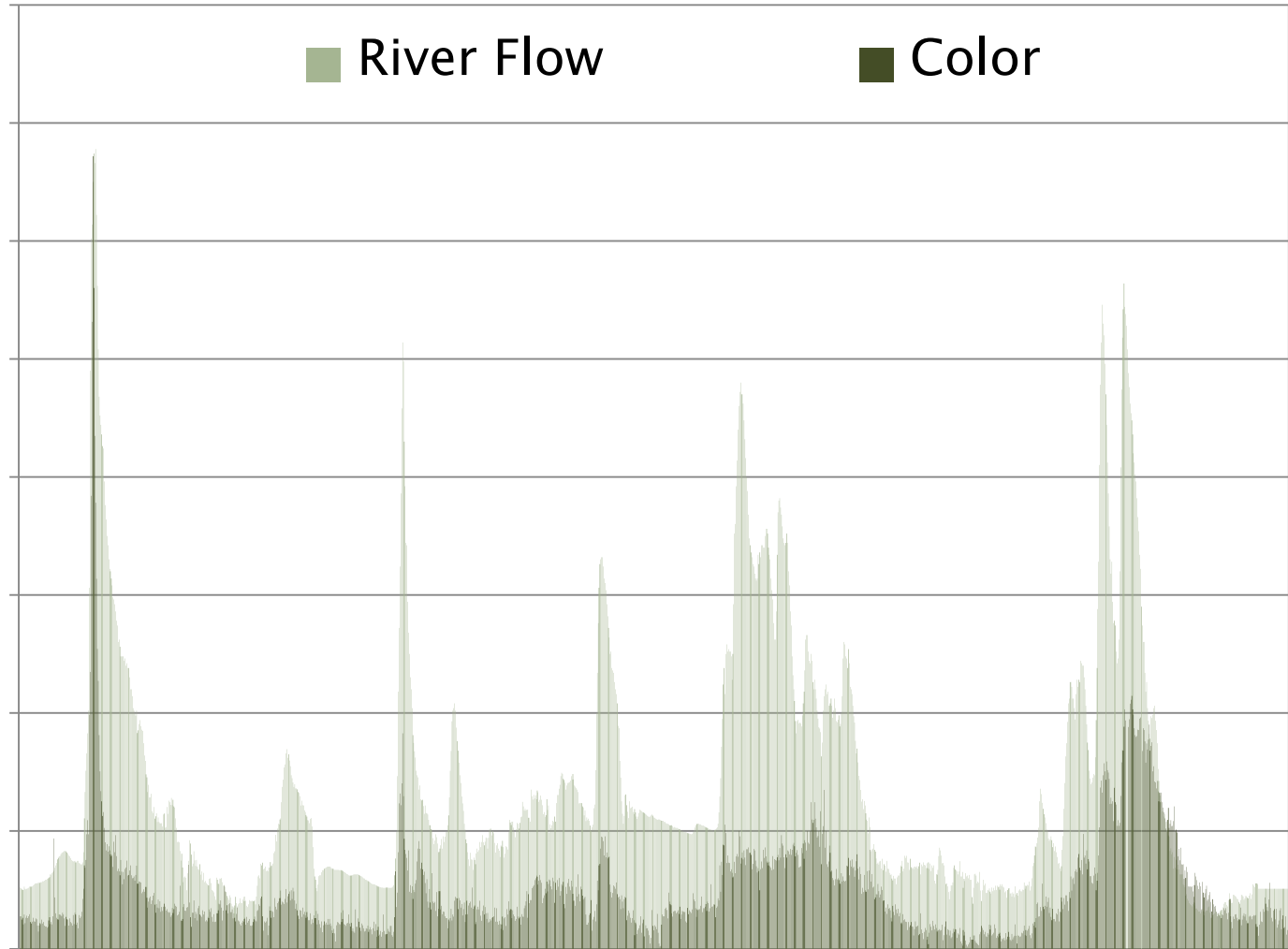
National Park Service Mississippi River Forum

Run Off Affects Turbidity



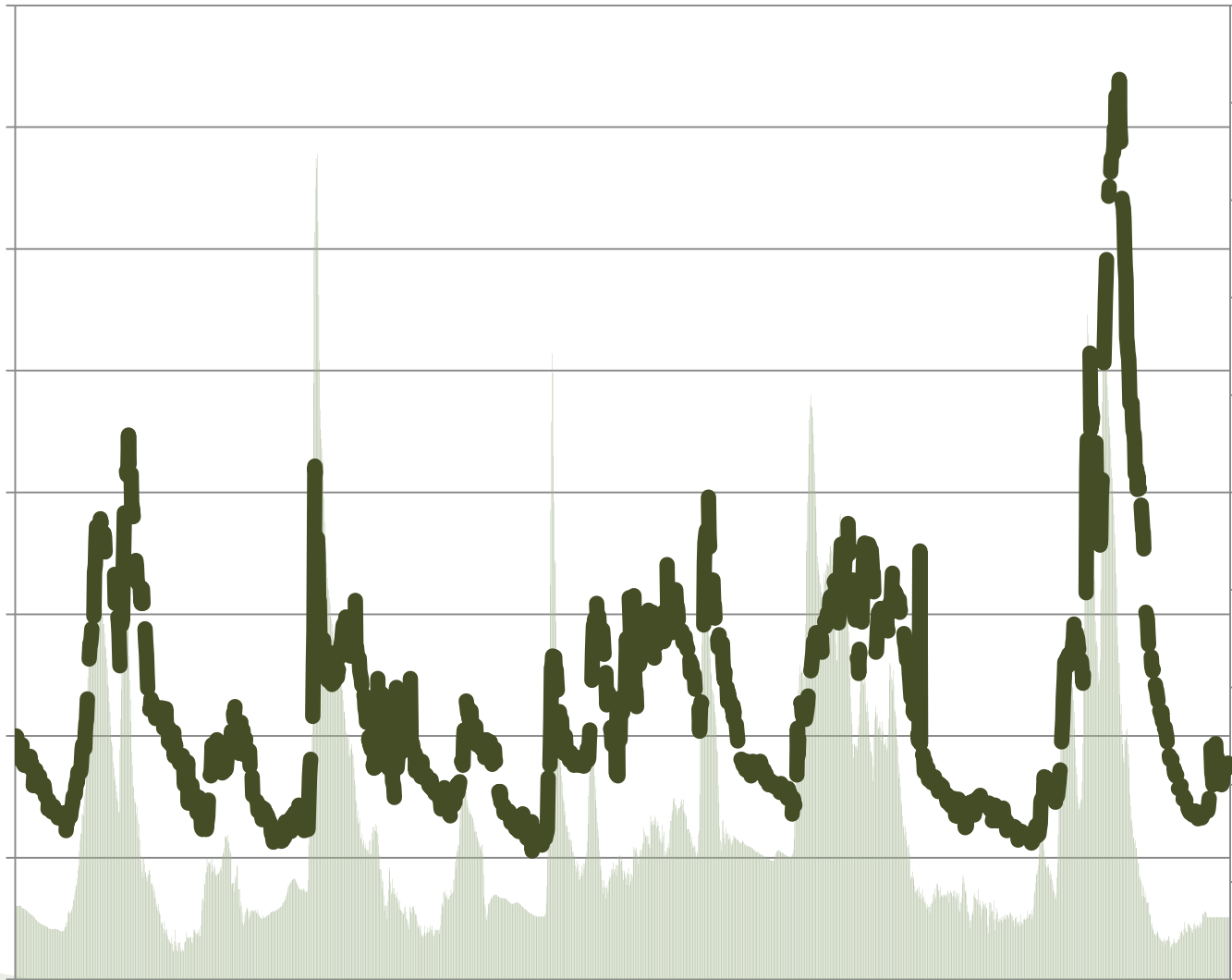
GENERAL TRENDS

Run Off Affects Color

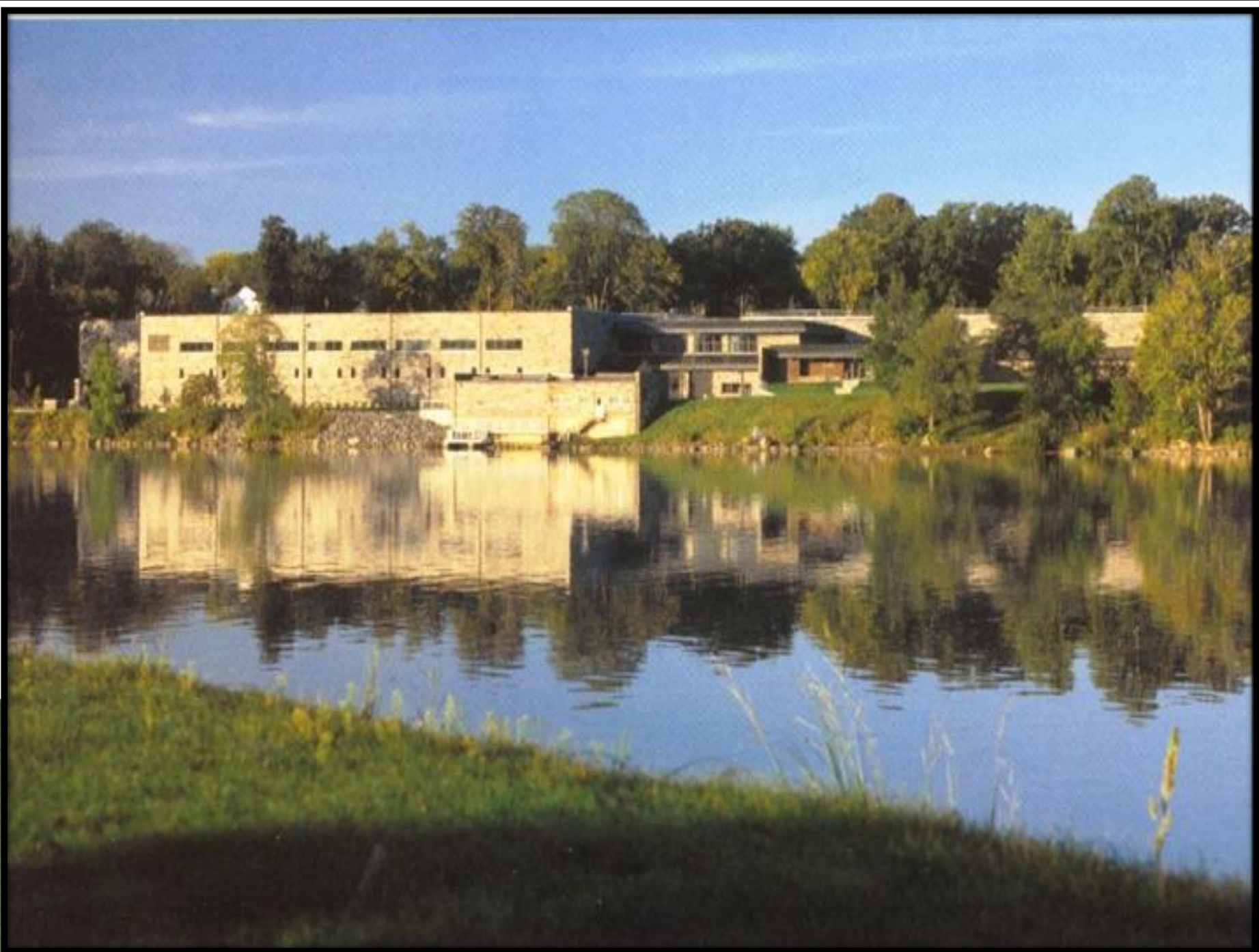


GENERAL TRENDS

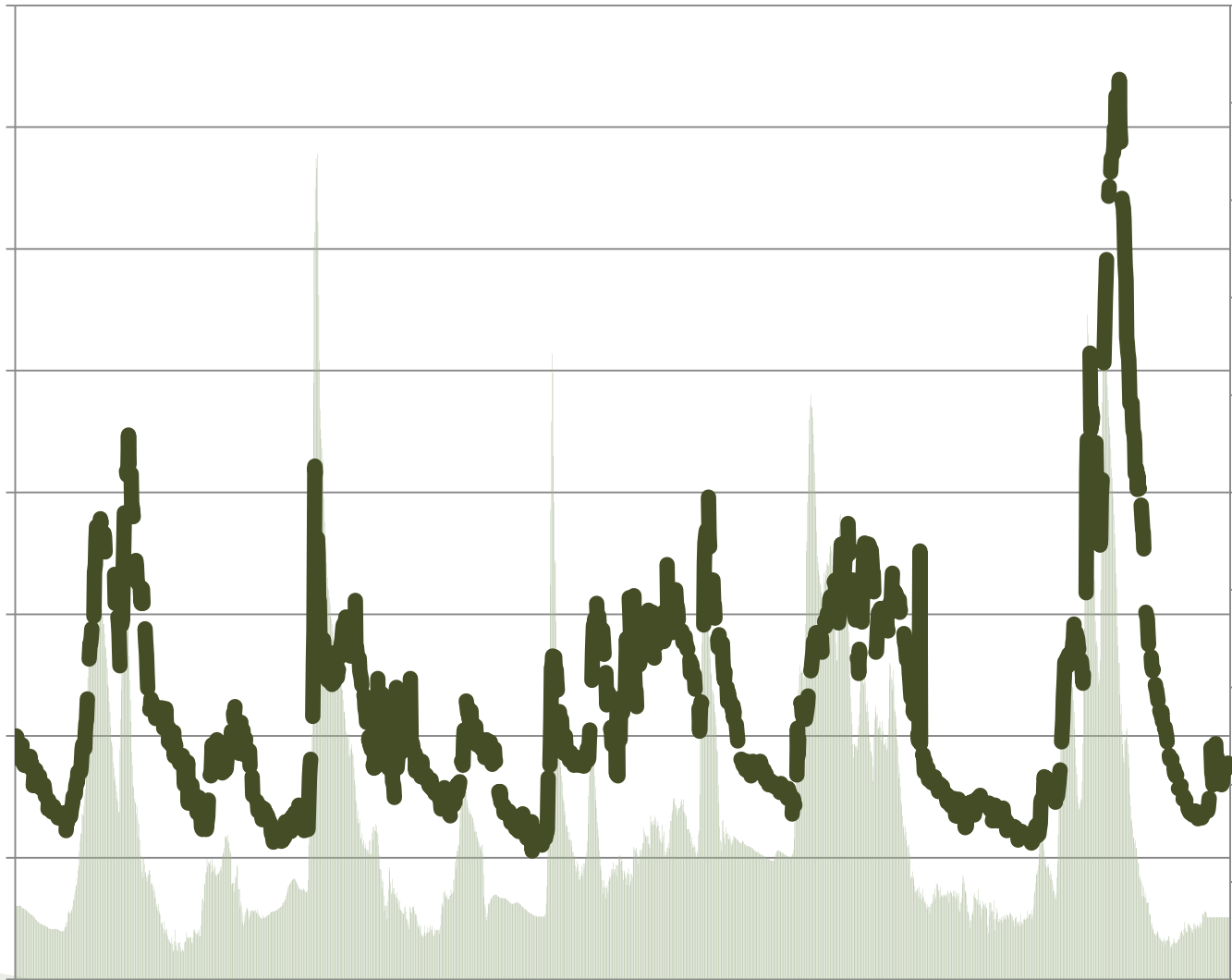
Run Off Affects Organics



IMPACTS ON TREATMENT

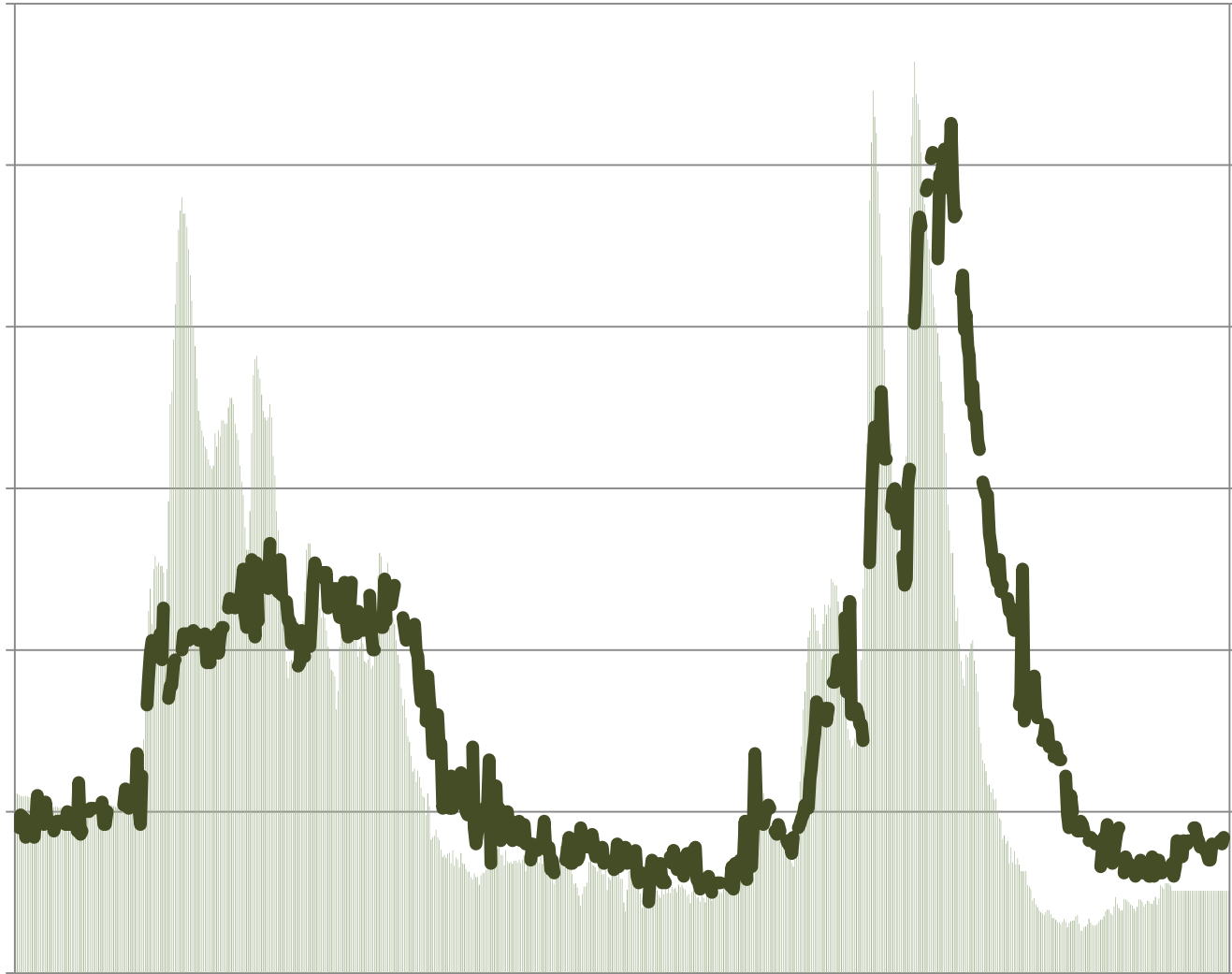


Run Off Affects Organics



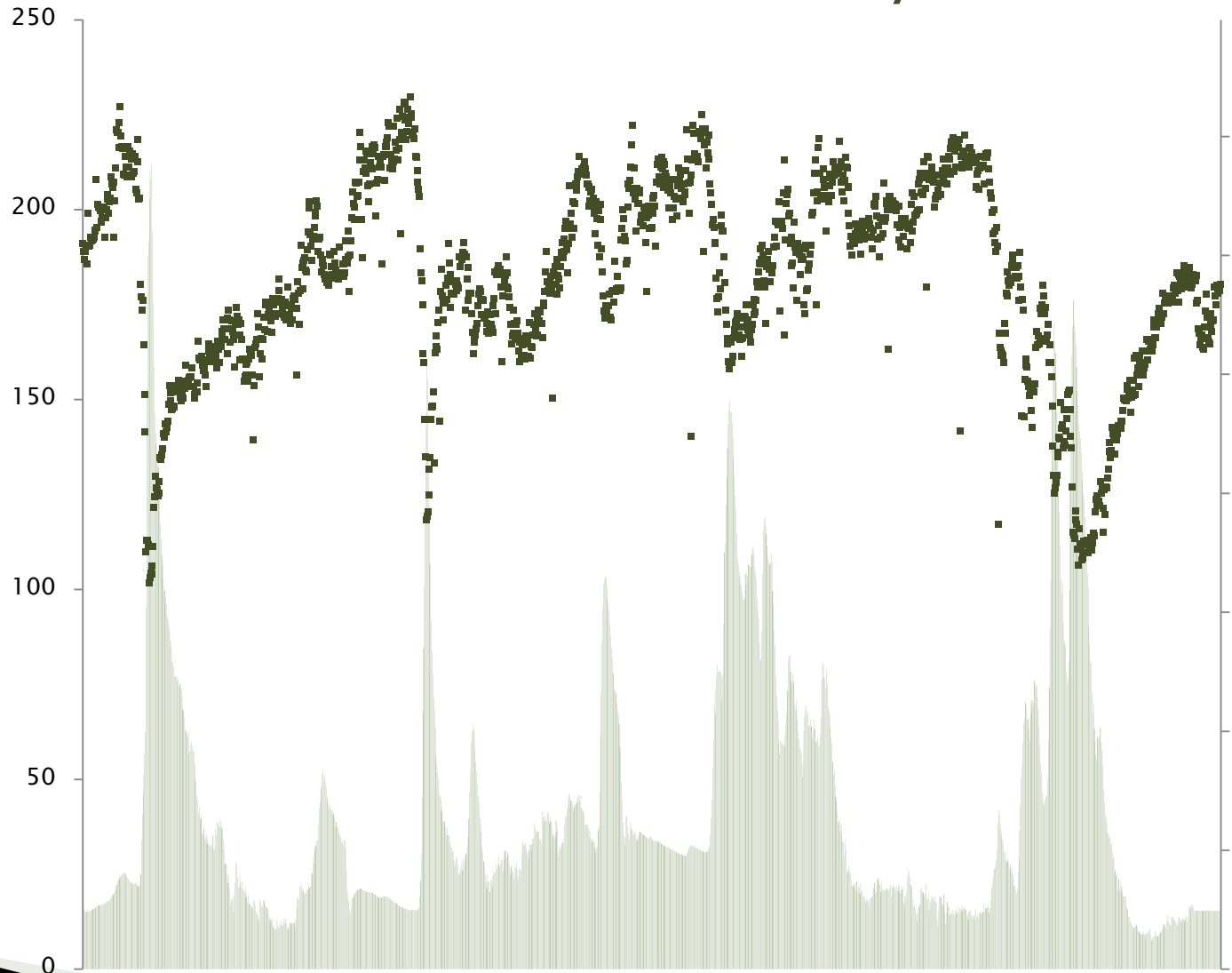
IMPACTS ON TREATMENT

Run Off Affects Tannin & Lignin



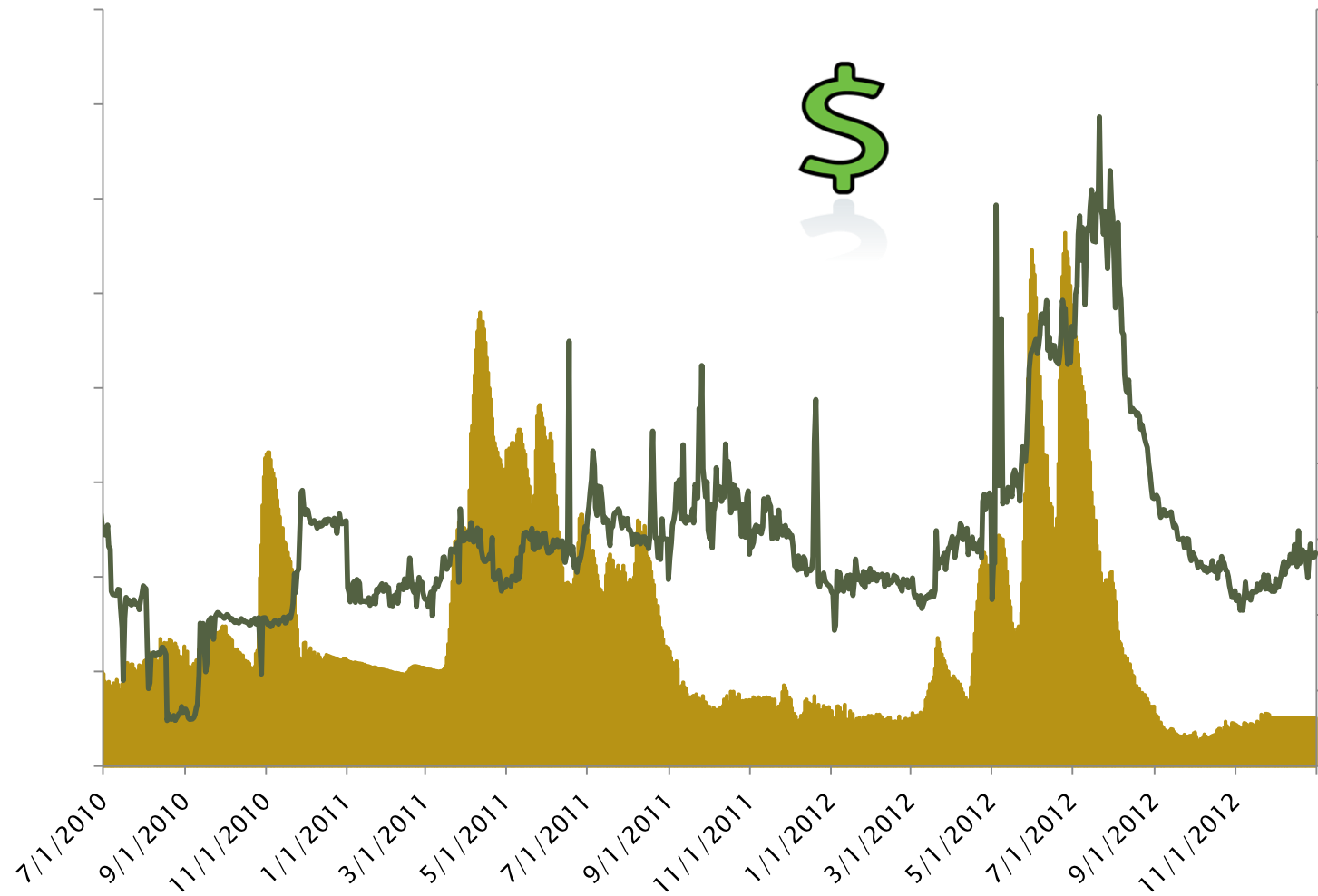
IMPACTS ON TREATMENT

Run Off Affects Alkalinity



IMPACTS ON TREATMENT

Run Off Affects Chemical Demand



IMPACTS ON TREATMENT



River Quality Affects Treatment:

Chemical Demand
Treatment Efficiencies
Disinfection ByProducts

National Park Service Mississippi River Forum



2012 Case Study – Perfect Storm

Early Spring.....

Warm Water/Early Algae

Drought Conditions.....

Stagnant Water

Heavy Rain Upstream.....

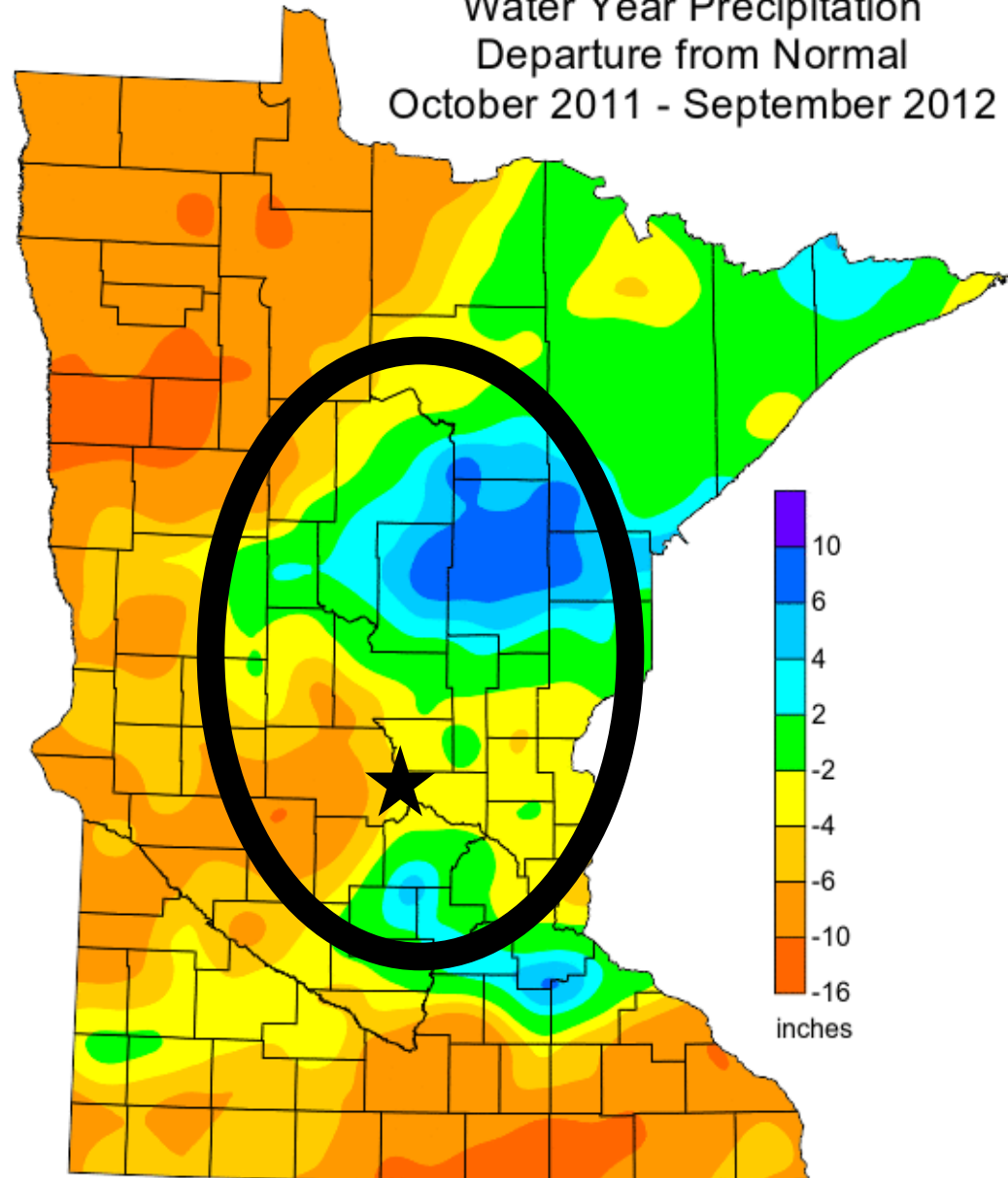
Basin Flush

National Park Service Mississippi River Forum



CASE STUDY

Water Year Precipitation
Departure from Normal
October 2011 - September 2012

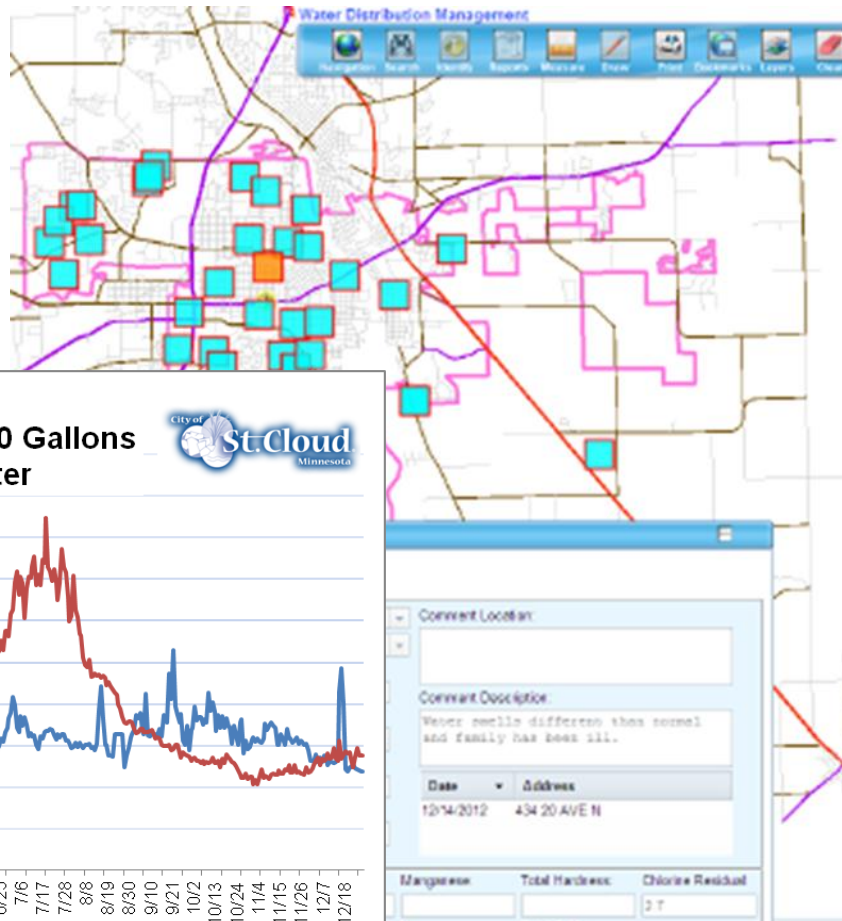
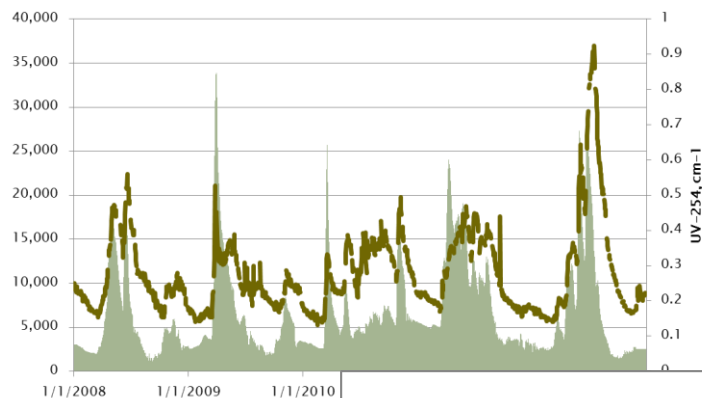


DNR State Climatology Office - December 21, 2012

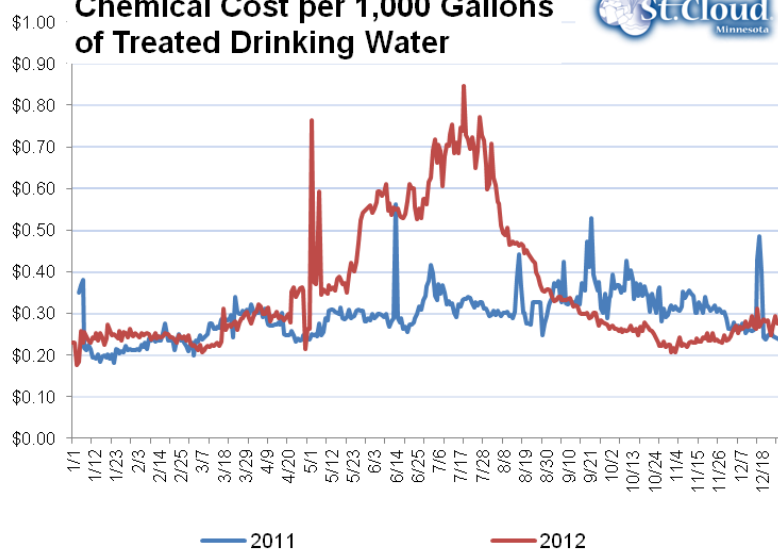
CASE STUDY



Runoff Affects Organics



Chemical Cost per 1,000 Gallons of Treated Drinking Water

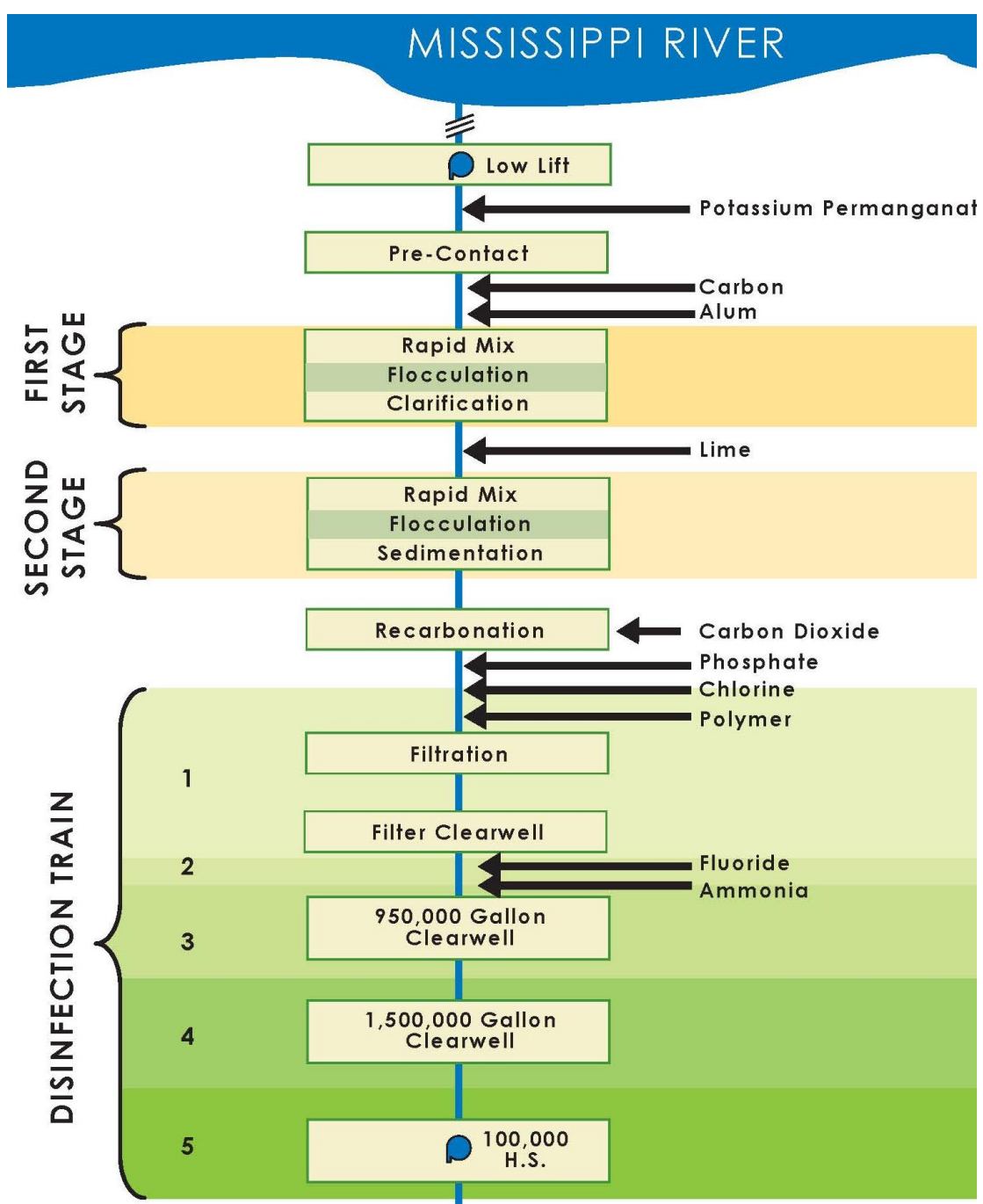




Virtual Tour

National Park Service Mississippi River Forum

Process Flow Diagram



Bar Screen & Intake Station



Gina Mikel, <http://www.scientificillustrator.com>

Pre- Contact Basin



Potassium Permanganate
Oxidize organic material

First Stage Treatment



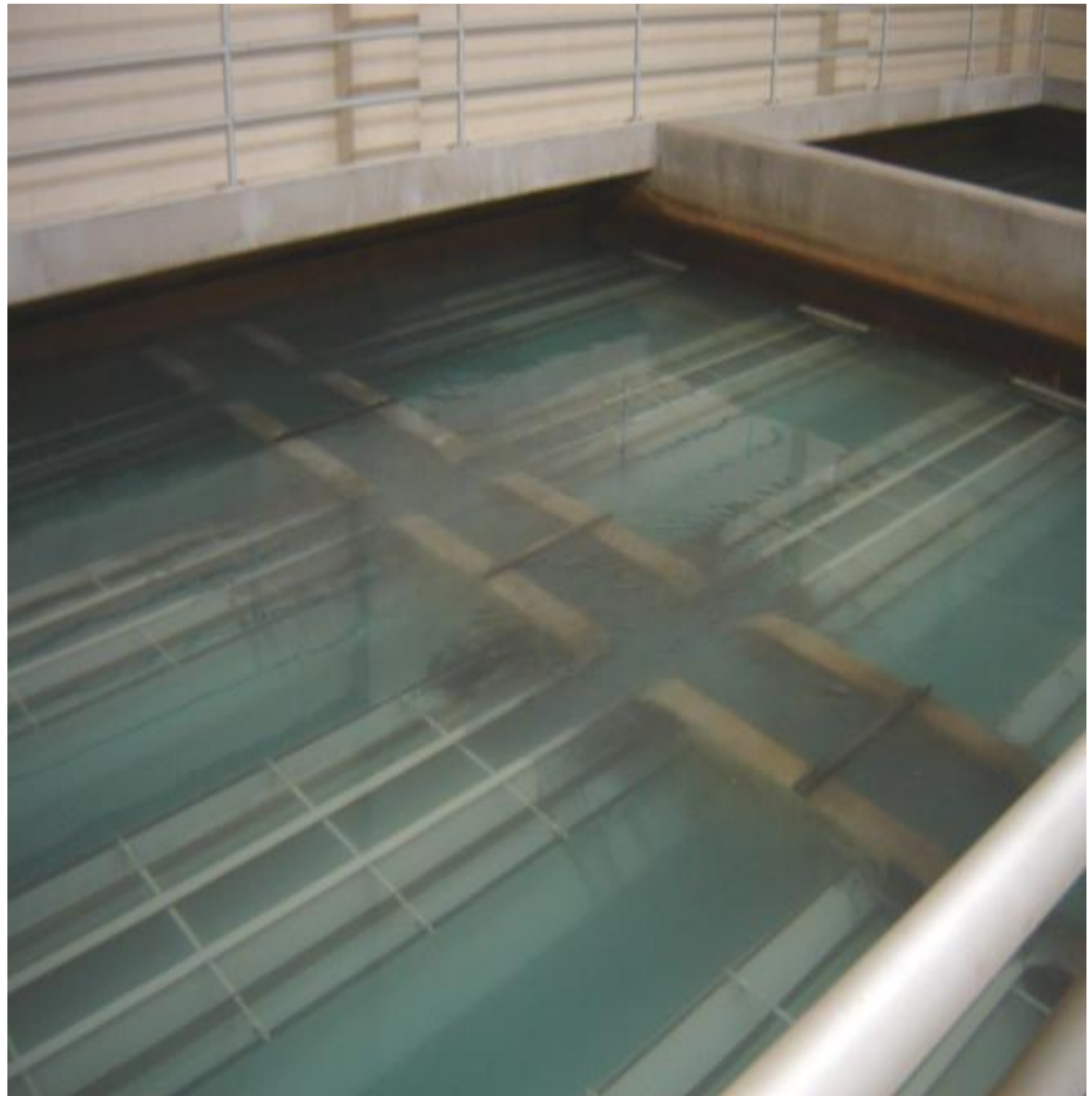
Aluminum Sulfate
Granular Activated Carbon
Coagulation/Flocculation/Settling

Second Stage Treatment



Lime Softening & Recarbonation
Coagulation/Flocculation/Settling

Disinfection & Filtration



Chlorine & Ammonia
Fluoridation
Physical Separation

Pumping & Distribution





THANK YOU

Shane Lund, Water Quality Coordinator
Shane.Lund@ci.stcloud.mn.us

National Park Service Mississippi River Forum